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CANADA AND THE WORLD METEOROLOGICAL ORGANIZATION

The World Meteorological Organization is one of 13 intergovernmental organizations linked with the United Nations through special agreements arranged by the Economic and Social Council and approved by the General Assembly and by the organization concerned. The Specialized Agencies of the United Nations are expert in their respective fields: labor, health, education, food and agriculture, finance and banking, civil aviation, postal matters, telecommunications, meteorology, international development and maritime matters.

History

Weather and climate move across the earth's surface without regard for national boundaries and thereby create similar problems all over the world. Realizing that large-scale international co-operation was necessary to solve these problems, the nations of the world have made a common effort to apply available knowledge of the weather and its evolution to the main activities of man. Canada, occupying as it does a considerable portion of the northern hemisphere, including a large part of the meteorologically vital Arctic, became one of the earliest participants in this international exchange of weather data.

From 1853 on, efforts were made to draw up a program of meteorological observations over the oceans, based on the collaboration of shipping belonging to most of the maritime countries. This was 14 years before Confederation made Canada a nation.

In 1878, the International Meteorological Organization, composed of the Directors of National Meteorological Services, was created during an international conference at Utrecht in the Netherlands. The infant Meteorological Service of Canada, established in 1839, was not represented at this meeting.

In 1833, the head of the Canadian Meteorological Service, C. Carpmael, sent a full report of the state of the Canadian service to the second meeting of the International Committee held at Copenhagen that year. By 1855 European meteorologists, recognizing the importance of weather data from Canada and the United States, were studying means of getting such information by cable.

During the present century, the tremendous development of transport and communications (sea and air navigation, radiotelegraphy and, more recently, meteorological and communications satellites) and the increased requirements of modern economic activity have given rise to a large number of technical problems, as well as unprecedented opportunities for improvement. A universal appreciation of the importance of meteorology, coupled with the surprising development of technology, has enabled this relatively young science to make considerable progress. These new developments showed that reorganization at an international level was necessary in view of the increased interest in meteorology.

Consequently, the Conference of Directors of the National Meteorological Services, which met at Washington in 1947 under the auspices of the International Meteorological Organization, adopted the World Meteorological Convention establishing a new organization founded on an agreement between governments. Just prior to this Conference, Canada had played host to the sessions of the Technical Commissions of the IMO, which met in Toronto in the summer of 1947.

The Convention adopted at Washington was ratified by a large number of states, and in 1951 the new World Meteorological Organization became active, the IMO having been dissolved. Furthermore, the General Assembly of the United Nations approved, in December 1951, the agreement between the United Nations and the World Meteorological Organization. The latter was thus recognized by the United Nations as a Specialized Agency.

The objectives of the WMO are:

- (1) to facilitate international co-operation in the establishment of networks of stations and centers to provide meteorological services and observations;
- (2) to promote the establishment and maintenance of systems for rapid exchange of meteorological information;
- (3) to promote standardisation of meteorological observations and ensure the uniform publication of observations and statistics;
- (4) to further the application of meteorology to aviation, shipping, agriculture, and other human activities;
- (5) to encourage research and training in meteorology.

Structure and Activities

The administrative and technical machinery of the WMO consists of:

- (1) A World Meteorological Congress in which 131 member countries and territories are represented by the heads of their meteorological services. It meets once every

four years to adopt technical regulations on meteorological practices and procedures and to determine general policy. The Fifth Congress was held in Geneva from April 3 to 28, 1967.

- (2) An Executive Committee that supervises the carrying out of resolutions of the Congress, initiates studies, and makes recommendations on matters requiring international action. It provides members with technical information, advice and assistance. It meets at least once a year, its membership including the President and the two Vice-Presidents of the WMO, the President of the WMO's six Regional Meteorological Associations, and 12 elected members.
- (3) Six Regional Meteorological Associations (Africa, Asia, South America, North and Central America, Europe and the Southwest Pacific), composed of member countries whose meteorological networks lie in or extend into the region.
- (4) Eight Technical Commissions established by the Congress to study and make recommendations on technical subjects including agricultural, hydrometeorological, synoptic, maritime and aeronautical meteorology and aerology, climatology and instruments and methods of observation.
- (5) A Secretariat under the direction of a Secretary-General.

The Fifth Congress adopted an Implementation Program to improve and give substance to the idea of a global weather system, called the World Weather Watch (WWW). The Program is based on the following principles:

- (1) All activities under the WWW on the territory of individual members are in principle the responsibility of the countries themselves.
- (2) Where national resources are inadequate, financing from outside will have to be arranged by bilateral or multilateral agreements, through the United Nations Development Program, or where necessary through a WMO Voluntary Assistance Program (VAP);
- (3) WWW implementation in regions outside national sovereignty (oceans, Antarctica, outer space) is to be based on voluntary participation of members.

The WWW introduces a system by which co-operation and efficiency are fully exploited. Three World Meteorological Centers, at Washington, Moscow and Melbourne, are responsible for providing global analyses of weather patterns and large-scale, long-range forecasts of the basic processes taking place. Regional meteorological centers will serve many of the common needs of countries and avoid much duplication of effort within a region, and National Meteorological Centers, operated by individual nations will, in turn, provide the full range and number of weather services appropriate to the needs and the developing resources of each country.

The WMO does not merely draw up regulations. It also carries through projects of interest to all states, calling for action on more than a national scale. The Organization's program includes assistance to member countries in developing their water resources, participation in tropical research, assistance in overcoming serious worldwide or regional deficiencies in meteorology. Weather forecasting for agriculture, international comparison of meteorological instruments and publication of a wide variety of international manuals and technical studies are other examples of the Organization's work.

The WMO also keeps abreast of the spectacular current developments in science and technology and uses them to obtain a better understanding of the atmosphere. The meteorological satellite is undoubtedly the most important single development in meteorology in many years. Progress in this field is extremely rapid and a broadening of its potential in the coming years is certain.

The WMO also takes part in arid-zone research and contributes to the development of arid lands by studying the climatic conditions knowledge of which would help to improve living conditions in these areas. Locust control and the protection of crops from this pest is a collective undertaking to which the WMO contributes. Another important activity of the Organization is to encourage by all possible means scientific research and instruction in meteorology.

An information periodical, the WMO Bulletin, keeps members and all interested persons informed of the Organization's activities and new developments in meteorology generally.

The WMO plays a very active part in the United Nations programs of technical co-operation and assistance towards economic development. It provides advice to facilitate the establishment and development of national meteorological services. It also promotes the training of meteorologists and specialists in all branches of weather science by fellowships, scholarships and courses. Experts are appointed to contribute their experience and skills and to co-operate with national authorities in solving the problems of the countries concerned.

New opportunities for an international contribution to large-scale national projects, such as water-resource development plans, have been opened up by the creation of the United Nations Special Fund.

Canadian Participation

The Canadian Meteorological Service has always played an active part in international meteorology. The first meeting of some of the Technical Commissions after the WMO was founded took place in Toronto in 1953. In 1954,

and again in 1959, the Commission for Aeronautical Meteorology held sessions in Montreal simultaneously with the Meteorological Division of ICAO. The Commission for Agricultural Meteorology met in Toronto in July 1962. The joint fourth session of the Commission for Aeronautical meteorology and the Fifth Air Navigation Conference of ICAO was held in Montreal in 1967. The Extraordinary Session of the Commission for Aeronautical Meteorology (a conjoint session with the 6th Air Navigation Conference) was held in Montreal in April 1969. The head of the Canadian Weather Service, Mr. J.R.H. Noble, is a member of the Executive Committee and is also President of Regional Association IV (North and Central America). Members of the Canadian Weather Service have served on all Technical Commissions, either as chairman, full member, or technical adviser.

Canada has undertaken to add the few additional observing stations needed in accordance with the World Weather Watch plan, and its communications system is to be converted to an automated system. The Canadian Government has also pledged \$500,000 between 1968 and 1971 to assist developing countries in the implementation of improvements required of them by the World Weather Watch plan.

Canadian ships on the high seas report their weather by radio to the nearest land station, and receive in return forecasts and storm-warnings for the area through which they are sailing. In return, vessels of foreign registry frequently provide reports of their local weather to Canadian coastal stations, and receive Canadian forecasts and storm warnings for marine areas contiguous to the Atlantic and Pacific shores of Canada. There is no charge for transmissions to ships. The national weather service in question bears the cost of transmitting the ship reports to its own forecast centres and to those of neighbouring states. Under the aegis of the WMO, a substantial increase has also taken place in international co-operation by the facsimile exchange of analyzed weather maps among the countries of the northern hemisphere.

Through the good offices of the WMO and other organizations, there exists an agreement to operate ocean weather stations aboard ships located in the Atlantic and Pacific. Reports from these ships greatly facilitate trans-oceanic flights by Canadian air-carriers. Canada operates Station Papa in the Pacific 900 miles west of Vancouver.

The fact that the Canadian Meteorological Service, as well as the Weather Service of the United States and the West Indies, could accurately track and forecast the life history of hurricane "Hazel" (October 1954) is a tribute to the co-operation achieved internationally through the WMO. The meteorological history of Canada, and of other member countries, is filled with similar almost daily examples of the benefits of international co-operation in meteorology.

Canada pays 2.6 per cent of the regular budget of the WMO. In 1967, the net budget of this Organization for assessment purposes was \$2,146,795 (U.S.).

